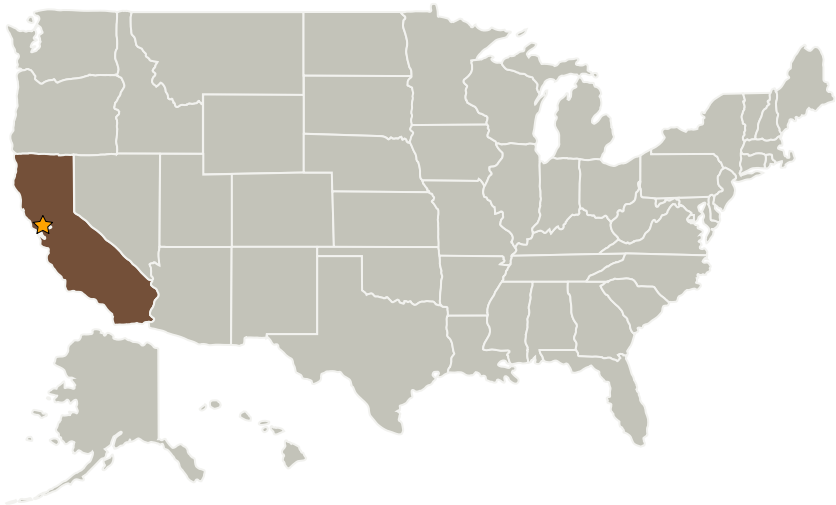
ESPA for Lunar and Science Missions, Phase I

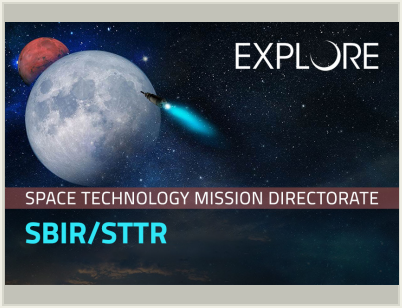
Completed Technology Project (2008 - 2008)

Project Introduction

NASA mission planning in the next decade includes small spacecraft and secondary flight opportunities on Evolved Expendable Launch Vehicles (EELVs), specifically Atlas V and Delta IV. NASA's use of EELVs is accelerated because of the impending termination of the Delta II launcher. Nearly all EELVs slated for launch have significant excess payload capacity. The EELV Secondary Payload Adapter (ESPA) Ring was developed by CSA Engineering under an Air Force SBIR to utilize excess lift capability by providing a secondary mission capability. ESPA, as built, can provide access to space for NASA lunar and science missions. However, to ensure that diverse NASA mission objectives can be achieved with the best possible mission configurations, structural tailoring of the ESPA will be required. The proposed effort will develop modular features of ESPA that are required for optimal NASA mission configurations targeting, but not necessarily limited to, the following: (1) Separable ESPA: Separation capability built into the ESPA Ring. (2) Hierarchical ESPA: Scaling of the ESPA design for larger EELV payloads and for small launch vehicles. (3) ESPA Mounts: Interior and exterior mounting for spacecraft and auxiliary structures. Phase 1 will establish feasibility for the modular ESPA designs. Plans will be presented for flight qualification of all designs. Phase 2 will produce flight qualified hardware to at least TRL 6 for a design determined to be the most desirable for near-term NASA implementation.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
CSA Engineering, Inc.	Supporting Organization	Industry	Mountain View, California

Primary U.S. Work Locations
California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Joseph Maly

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.1 Cryogenic Systems
    - TX14.1.2 Launch Vehicle Propellant